

DCM-20 Inline Optical Brix Monitor for Pharma & Food Ingredients

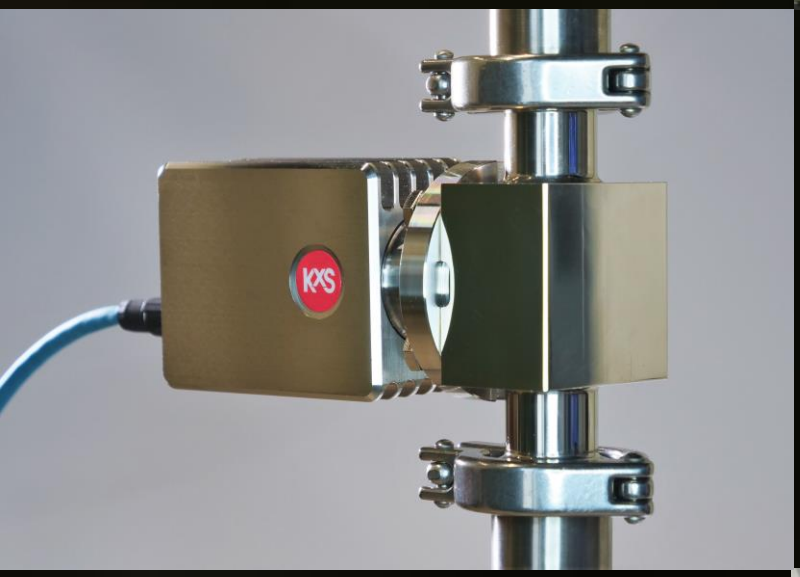
reddot winner 2021

KXS

Applications

DCM-20 inline optical Brix monitor is designed with highest aseptic standards to:





- **Define** liquid product interfaces in beverage and dairy filling lines
- **Achieve and ensure** product quality in sugar dissolving, juice blending and jam vessels
- **Correlate** membrane filtration efficiency in protein separation in Reverse Osmosis and Ultra Filtration systems
- **Optimize** steam feed in dairy evaporation processes

Other typical application uses:

- Dairy processing
- Tomato paste production
- Yeast extraction
- Sugar syrup preparation





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46-04

EHEDG
EUROPEAN HYGIENIC ENGINEERING & DESIGN GROUP

Installation examples



Single-piece flow cell in straight pipe sections designed for high pressure installations



1.5” Connection in straight pipe section



2.5” Connection in pipe bend with existing flow cell



0.5” Pharma flow cell with mini-clamp

Single-piece flow cells

- Scalable to process line size
- EHEDG and 3-A certified

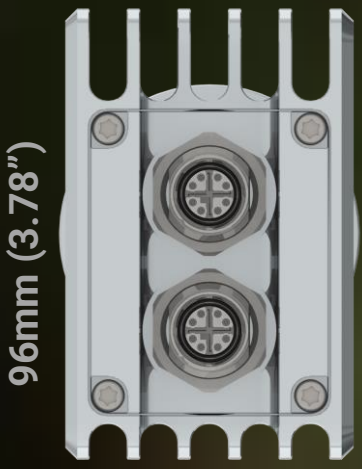


Extra Small footprint

- Weight 1.3kg (2.9lbs)
- True stand-alone
- Optional Modular Connection Unit and Web HMI



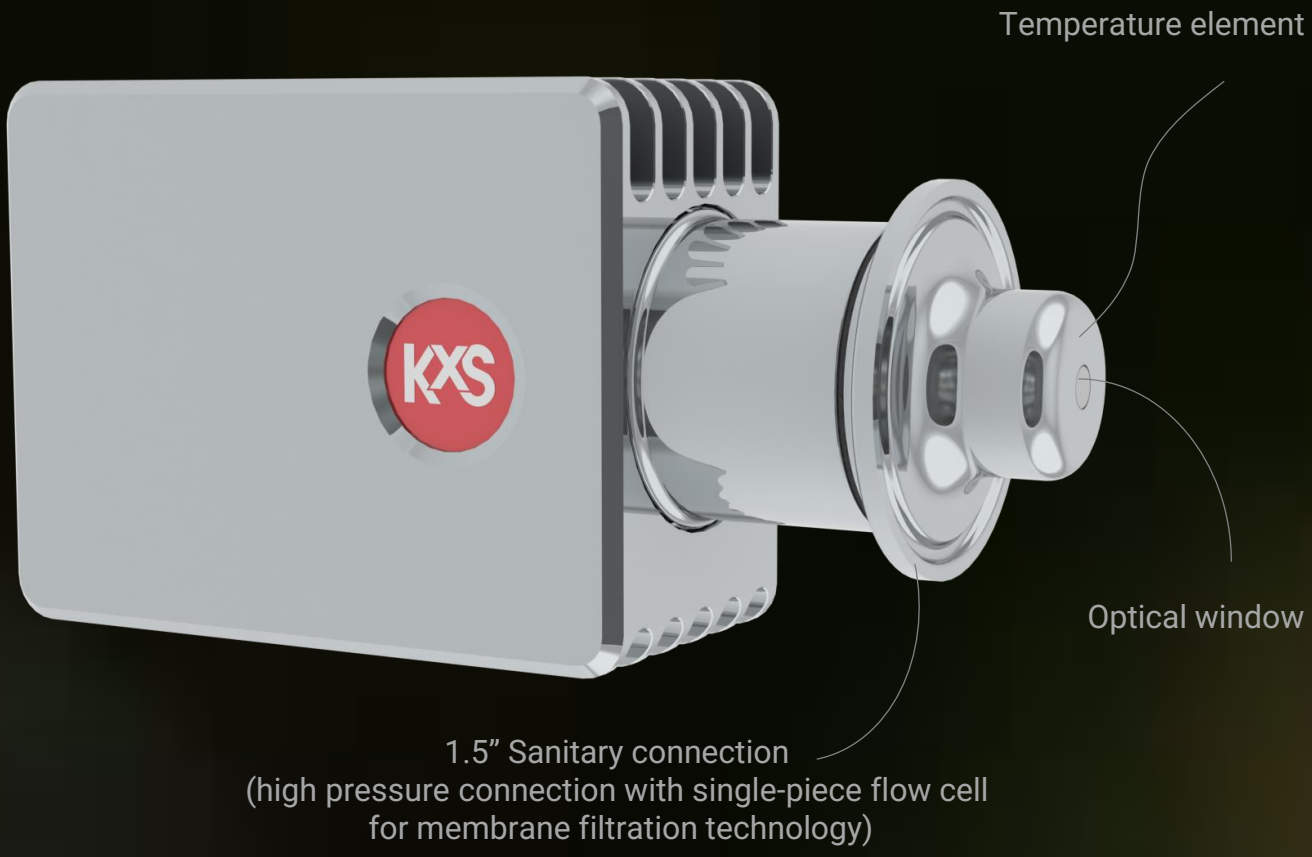
140mm (5.51”)



48mm (1.89”)

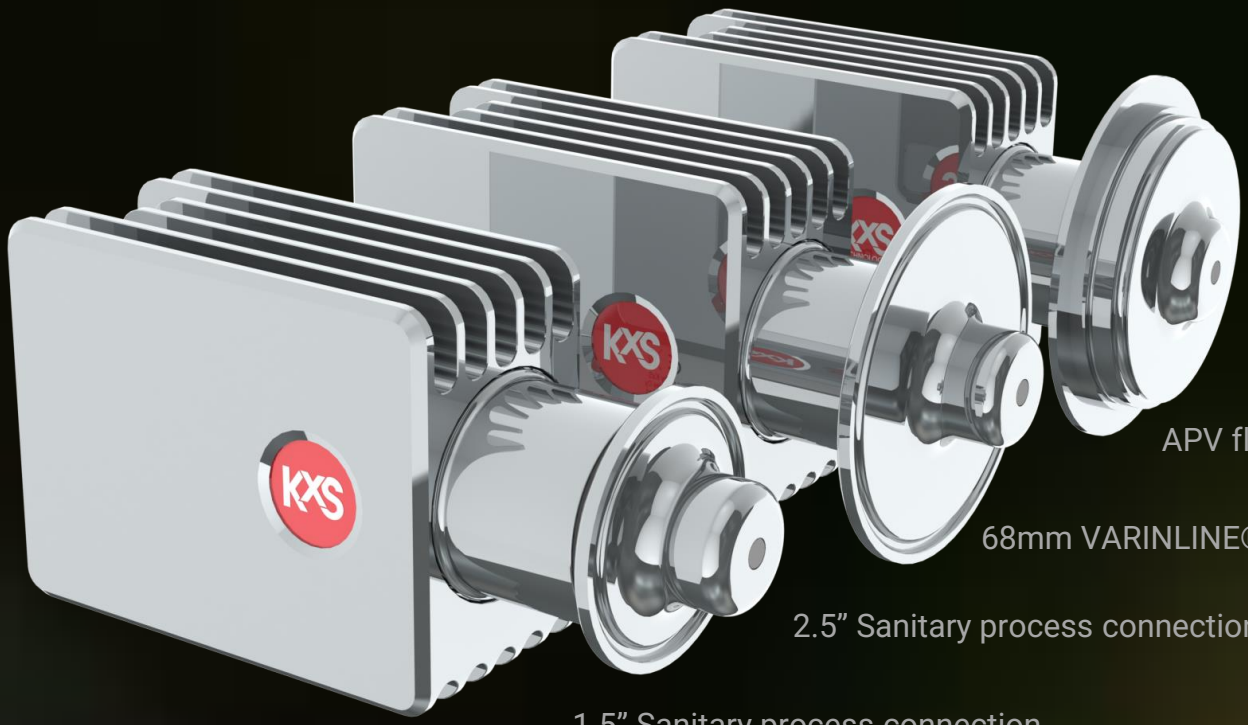
Thermal management

- Solid optics module provides reliable thermal properties and rigidity
- Isolated electronics for true Brix temperature compensation
- Individual zero-point calibration


Temperature element
Optical window
1.5” Sanitary connection
(high pressure connection with single-piece flow cell
for membrane filtration technology)

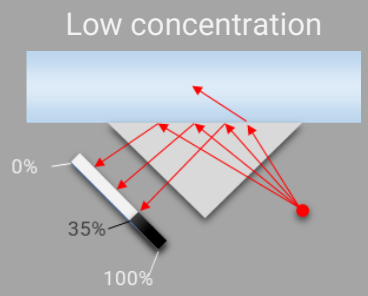

Cooling fins
AISI 316L Stainless steel
wetted parts
Solid-optics
Electronics
Connectors

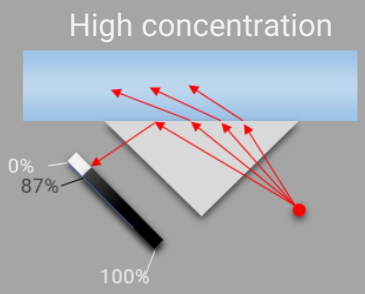
Aseptic process connections



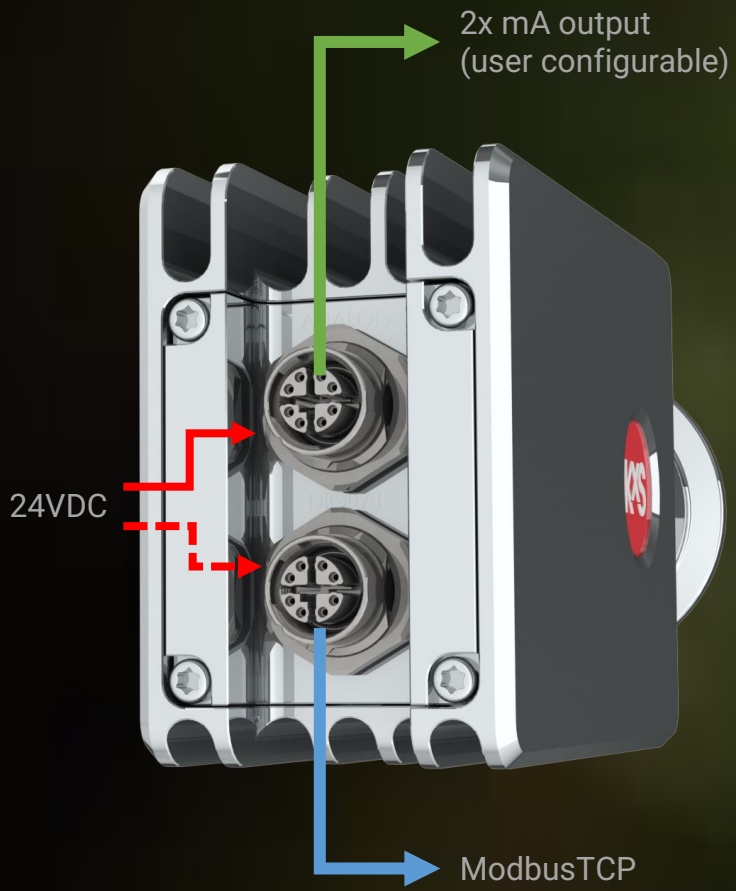
Measurement principle

The optical concentration measurement is based on *Snell’s law* and *critical angle of total reflection*. Light is transmitted from the LED to the interface between the optical window and the liquid. With the concentration of the liquid, defined angles are reflected back creating light and shadow interface images on the digital camera. The interface of the light activated pixels is converted to refractive index units RIU and Brix concentration values.





Digital and analog M12 connectors



DCM-20 Brix monitor specifications

Refractive Index range:	Full range, nD=1.3200...1.5300 (equal by definition to 0...100%wt)
Output units:	Brix / Conc% / g/cm^3 / refractive index unit RIU
Measurement precision:	± 0.025 Brix/%wt
Measurement accuracy:	± 0.0002 refractive index unit RIU
Speed of response:	1 sec. undamped
Optics:	No mechanical adjustments and digital measurement with 4000 pixel camera, 589 nm wavelength (sodium D-line) light emitting diode (LED), built-in Pt-1000 temperature sensor (linearization according to IEC 751)
Temperature compensation:	Automatic, individual zero point calibration
Calibration:	NIST traceable calibration, verification with standard RIU liquids
Wetted parts:	AISI316L EN 1.4435 Stainless steel, Sapphire optical window Optional: Alloy 20, Hastelloy C-276/Titanium Sensor housing: AISI316 Stainless Steel
Hygienic design:	3-A Sanitary Standard 46-04 certified and EHEDG (European Hygienic Equipment Design Group) Type EL Class I certified.
Process connection:	1.5” and 2.5” sanitary connection, Varinline® and APV tank bottom flange Optional flow cell housing connections with sanitary or DIN/ANSI flanges
Process pressure:	9-55 bar, 130-800 psi (depending on process connection)
Process temperature:	-40°C (-40°F)...100°C (212°F) continuous process temperature Withstands 130 °C Clean-in-Place CIP and Steam-in-Place SIP sequences
Ambient temperature:	-40°C (-40°F)...65°C (149°F)
Sensor protection class:	IP67, Nema 4X
Installation:	Indoor/Outdoor, unclassified area
Sensor weight:	1.3 kg, 2.9 lbs

Outputs and connections:

Digital M12 connector:	24VDC power supply, Modbus TCP for user interface and PLC connection, normal cable length 10 m(33 ft), max 70 m(230 ft)
Analog M12 connector:	24VDC power supply, 2 pcs independent 4-20 mA user configurable outputs, normal cable length 10 m(33 ft), max, 200 m(660 ft). Max. load 1000 Ohm
Sensor Power consumption:	max. 2.5W
Options:	Single-piece flow cells for ½”...4” process lines Modular Connection Unit enclosure with optional display/user interface Independent 7” or 15” Web HMI, full color touch screen interface, Optical window wash with steam or high pressure water. Direct integration with Rockwell’s PLC for Ethernet IP communications

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